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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/601,912	12/01/2000	Vasilios Kanellopoulos	6-1034-040	5277

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EXAMINER

WYROZEBSKI LEE, KATARZYNA I

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 04/10/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/601,912

Applicant(s)

KANELLOPOULOS ET AL.

Examiner

Katarzyna W. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 August 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 3, 6, 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to the claim 3, n is not defined.

With respect to claim 6, the applicant discloses that the reticulation is hexamine and such is further disclosed in the specification and represented in chemical formula B. With respect to the above formula, it is representative of specific hexamethylene tetramine. There are only four nitrogen atoms not six. At the same time, the specification discloses the reticulation agent and does not name the above-mentioned figure as figure B (see page 3), therefore the specification is not consistent with the claims.

With respect to claim 9, it is not clear as to what exactly are the units of the pressure. Since the specification only enables for atm as the pressure unit therefore the examiner will treat the claim as reading on 50 atm. The applicant is required to make an appropriate correction.

### ***Specification***

3. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

### ***Claim Objections***

4. Claims 6 and 7 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim 7 depends on multiply dependent claim 6, which in turn depends on multiply dependent claim 3. See MPEP § 608.01(n). For more prompt prosecution of the case, the claims have been treated as dependent on claim 1.

The language of claim 1 reads “a part at least of the phenolic groups”, which is confusing. The examiner interpreted such language as at least part of the phenolic groups are bound to the terminal silanol groups. The applicant is asked to clarify the claim language.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 5-7, 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Iimuro (US 5,123,349).

The example of the prior art of Iimuro discloses a composition for a binder utilized in friction materials such as brake linings. The composition in the examples taught discloses mixing of NOVOLAK phenolic resin, epoxidized silicon oil further defined in specification in col. 3, figure 1 and organopolysiloxane having terminal silanol groups. The mixture is then mixed in test examples with hexamethylene tetramine to arrive at cured phenolic-based binder, which has been powdered for future use.

The present claims require that at least part of phenolic groups be bound to the terminal silanol groups. Although the prior art of Iimuro does not explicitly disclose such limitation, upon heating, which is taught, a condensation will occur inherently causing phenolic groups and silanol groups of the two resins to bind. The prior art of Iimuro therefore reads on the present claims. The condensation reaction between the hydroxyl groups of the phenolic resin and silanol groups of the organopolysiloxane are further depicted in claim 1 of the prior art of Iimuro.

According to the claim 6 of the prior art of Iimuro, the organopolysiloxane resin contains hydrocarbon substituents, which include phenyl and xyl group known as dimethyl benzene.

In the process of Iimuro, the components are mixed and melted to afford condensation at 170°C, crosslinked at 170°C, post kneaded with heat in temperature range of 110-120°C and crushed to give a powder having particle size of 0.1 microns to 10 microns (see various examples). The powder was molded into a specimen at 170°C and pressure of 100 kg/cm<sup>2</sup> then the specimen was placed in the oven at 400°C.

In the light of the above disclosure, the prior art of Iimuro anticipates the claims rejected above:

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 2-4, 8-11, 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iimuro (US 5,123,349) in view of Kane (US 5,736,619).

The discussion of the disclosure of the prior art of Iimuro from paragraph 6 above is incorporated here by reference.

In addition to the disclosure in paragraph 6, the prior art of Iimuro teaches in the specification, that the crosslinking reaction can be carried out in a temperature range of 60-200°C. Although the examples disclose 170°C, the specification teaches lower temperatures also and therefore makes such alteration obvious to one having ordinary skill in the art.

The difference between the present invention and the disclosure of the prior art of Iimuro is recitation of different temperature ranges as well as different phenolic monomers, which can be utilized in making binders modified with organopolysiloxane.

With respect to the above differences the prior art of Kane discloses another binder utilized in disk pads as part of friction material. In col. 9 and 10 of the prior art of Kane, phenolic resin is reacted with formaldehyde to form phenolic resin, wherein the resulting resin in col. 10 contains at least of non aromatic alcoholic group HOCH<sub>2</sub>- required by the claims of the present invention. One of the monomeric units utilized to make the resin of Kane is phenyl ring alone, which also satisfies figure A' of the present invention. As a result a phenolic RESOLE or NOVOLAK are created.

The phenol resin of the prior art of Kane is also reacted with organopolysiloxane containing silanol group. Further the prior art of Kane teaches that the phenolic binders can be utilized in combination with epoxy resin to optimize chemical resistance and corrosion. Although the specific examples are not provided, such teaching would render addition of epoxy resin obvious and having positive impact.

The preferred curing agent of the prior art of Kane is also hexamethylene tetramine although other amine functional compounds are not excluded.

In the process of the prior art of Kane, the components of the composition were mixed at room temperature in plastic beaker then transferred into steel mold. The composition was then cured at a temperature of 65°C and heated after curing at 120°C, cut into test bars and further cured at 70°C. At the end the samples were dried at 120°C.

Although the prior art of record does not teach the degassing step in the process, such would have been an obvious step to one having skill in the art. During the reactions, which occur in making disclosed composition a volatile matter is generated and needs to be evacuated. One can raise the pressure in order to minimize the amount of volatile nitrogen produced. Support for such allegation can be found in the prior art of Kakegawa (US 5,889,084 examples).

Compositions utilized in brake pads such as those disclosed above have to have good abrasion resistance and have to have flexibility.

In the light of the above disclosure, it would have been obvious to one having ordinary skill in the art at the time of the instant invention to utilize the process and the phenolic of Kane in the process and phenolic resin of Iimuro and still obtain modified phenolic binder, which can be used in friction materials. Both prior art of Iimuro and Kane disclose teachings of



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organopolysiloxane, phenolic novolacs or resols, epoxy resins and hexamethylene tetramine to make friction material. Since the composition of the two disclosures overlap the process or combination of process conditions would obviously result in effective composition usable as friction material.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katarzyna W. Lee whose telephone number is (703) 306-5875. The examiner can normally be reached on Mon-Thurs 6:30 AM-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (703) 306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

KIWL  
April 4, 2002

EDWARD J. CAIN  
PRIMARY EXAMINER  
GROUP 1500  
